

Patent claims

1. A device for the digital exposure of light-sensitive materials, with an electronic picture memory (2) for storing a master image, with an exposure unit (8) which preferably comprises a light source (22), an electronically activatable light modulator (21) for representing a part picture (24) of the master image, and imaging optics (23) for projection of the part picture (24) onto the light-sensitive material (10), with a drive device consisting of motors (9) and of a motor control (12), for the movement of the exposure unit (8) parallel to the surface of the light-sensitive material (10), with a scroll means (7) for scrolling a picture strip (25, 26) of the master image through the light modulator (21), and with a control device (1) for synchronising the drive device (9, 12) with the scroll means (7), **characterised in that** a rapid intermediate memory (16) for storing a strip-like region (25, 26) of the master image is provided, from which the picture data for the part picture (24) to be exposed in each case, may be transmitted onto the light modulator (21) synchronously with the movement of the exposure unit (8).
2. A device according to claim 1, **characterised in that** the intermediate memory (16) is arranged in the exposure unit (8).
3. A device according to claim 1 or 2, **characterised in that** the intermediate memory (16) comprises two part memories (17, 18) for the storage of two picture strips (25 26') of the master image, and that during the transmission of the data from the first part memory (17) to the light modulator (21) for the exposure of the first picture strip (25), the data for the exposure of the next picture strip (26) of the master image may be transmitted from the picture memory (2) to the second part memory (18).

4. A device according to one of the preceding claims, **characterised in that** the control device (1) consists of a computer with a control program, wherein the picture memory (2) is also accommodated in the computer.
5. A device according to claim 4, **characterised in that** the control
5 program comprises an exposure data manager (4), a picture data manager (6) and a position data manager (5), wherein the picture data of the picture memory (2), is divided into data packages suitable for the stripwise exposure by the exposure data manager (4), and are transferred to the picture data manager (6), wherein the exposure data manager (4) produces position data
10 and speed data for the motor control (12), which are transferred to the position data manager (5).
6. A device according to claim 5, **characterised in that** the control device (1) comprises the scroll means (7) which cooperates with a trigger card (3) designed with regard to hardware, that the trigger card (3) is
15 connected to position sensors (13) which deliver data on the actual position of the exposure unit (8), and that the trigger card (3) controls the data flow from the intermediate memory (16) to the light modulator (21) synchronously with the movement of the exposure unit (8), wherein a handshake (28) between the trigger card (3) and the motor control (12) causes the motor
20 control (12) to call up the position- and speed data from the position data manager (5) and to accordingly activate the servomotors (9).
7. A device according to claim 6, **characterised in that** the scroll means (7) cooperates with the picture data manager (6) in a manner such that the stripwise transmission of the picture data from the picture data manager (6)
25 to the intermediate memory (16) is always effected just at the time when no data for the activation of the light modulator (21) is taken from the respective part memory (17, 18).

8. A device according to one of the preceding claims, **characterised in that** the exposure time for a pixel is roughly equal to the travel time which the exposure unit (8) requires for travelling over a pixel width.
9. A device according to one of the preceding claims, **characterised in that** the division of the master image into picture strips is effected in a manner such that the picture strips (25, 26) partly overlap and that the light quantity per pixel column orientated in the scroll direction, which serves for the exposure, is arranged reducing towards the edges of the picture strips (25, 26), so that a uniform exposure of the complete printing plate (10) results.
10. A device according to one of the preceding claims 1 to 8, **characterised in that** the division of the master image into picture strips is effected in a manner such that the picture strips (25, 26) abut on one another in a seamless manner and that the light quantity per pixel column orientated in the scroll direction, which serves for exposure, is set such that the optical impression of the left and of the right edge of the picture strip (25, 26) is identical, so that a uniform exposure of the complete printing plate (10) results.
11. A method for the digital exposure of light-sensitive materials using a device with an electronic picture memory (2) for storing a master image, with an exposure unit (8) which preferably comprises a light source (22), an electronically activatable light modulator (21) for representing a part picture (24) of the master image, and imaging optics (23) for the projection of the part picture (24) onto the light sensitive material (10), with a drive device, consisting of motors (9) and a motor control (12), for moving the exposure unit (8) parallel to the surface of the light-sensitive material (10), with a scroll means (7) for scrolling a picture strip (25, 26) of the master image through the light modulator (21), and with a control device (1) for synchronising the

drive device (9, 12) with the scroll means (7), **characterised in that** the method encompasses the use of a rapid intermediate memory (16) in which a strip-like region (25, 26) of the master image is stored, from which the picture data for the part picture (24) to be exposed in each case is
5 transmitted onto the light modulator (21) synchronously with the movement of the exposure unit (8).

12. A method according to claim 11, **characterised in that** the intermediate memory (16) comprises two part memories (17, 18) for storing two picture strips (25, 26) of the master image, and that during the
10 transmission of the data from a first part memory (17) to the light modulator (21) for the exposure of a first picture strip (25), the data for the exposure of the next picture strip (26) of the master image is transmitted from the picture memory (2) to the second part memory (18).

13. A method according to claim 11 or 12, **characterised in that** the
15 control program comprises an exposure data manager (4), a picture data manager (6) and a position data manager (5), that the picture data of the picture memory (2) is divided by way of the exposure data manager (4) into data packages which are suitable for the stripwise exposure, and are transferred to the picture data manager (6), wherein the exposure data
20 manager (4) produces position data and speed data for the motor control (12) which is transferred to the position data manager (5).

14. A method according to claim 13, **characterised in that** the control device (1) comprises the scroll means (7), that the scroll means (7) cooperates with a trigger card (3) which is designed with regard to hardware
25 and which is connected to position sensors (13), that the position sensors (13) provide data on the actual position of the exposure unit (8), and that the trigger card (3) controls the data flow from the intermediate memory (16) to the light modulator (21) synchronously with the movement of the exposure

unit (8), wherein a handshake (28) between the trigger card (3) and the motor control (12) causes the motor control (12) to call up the position- and speed data from the position data manager (5), and to accordingly activate the servomotors (9).

- 5 15. A method according to claim 14, **characterised in that** the scroll means (7) cooperates with the picture data manager (6) in a manner such that the stripwise transmission of the picture data from the picture data manager (6) to the intermediate memory (16) is always effected just at the time when no data for the activation of the light modulator (21) is taken from
10 the respective part memory (17, 18).

16. A method according to one of the preceding claims 11 to 15, **characterised in that** the exposure time for a pixel is roughly equal to the travel time which the exposure unit (8) requires for travelling over a pixel width.

- 15 17. A method according to one of the preceding claims 11 to 16, **characterised in that** the division of the master image into picture strips is effected in a manner such that the picture strips (25, 26) partly overlap, and that the light quantity per pixel column orientated in the scroll direction, which serves for exposure, is arranged decreasing towards the edges of the picture
20 strip (25, 26), so that a uniform exposure of the complete printing plate (10) results.

18. A method according to one of the preceding claims 11 to 16, **characterised in that** the division of the master image into picture strips is effected in a manner such that the picture strips (25, 26) abut one another in
25 a seamless manner and that the light quantity per pixel column orientated in the scroll direction, which serves for exposure, is set such that the optical impression of the left and of the right edge of the picture strip (25, 26) is

identical, so that a uniform exposure of the complete printing plate (10) results.